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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,085	01/13/2005	Hans-Jurgen Schreier	B-7221	4557
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EXAMINER				
TUROCZY, DAVID P				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/521,085

Applicant(s)

SCHREIER ET AL.

Examiner

DAVID TUROCY

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 8-20 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 10/29/07, 9/17/07, 7/1/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 7/1/2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. Specifically, the copy of XP60241291 was submitted concurrently with the IDS filed 7/1/2005.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on 7/17/2002. It is noted, however, that applicant has not filed a certified copy of the foreign application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6180179 by Kawaguchi et al., hereinafter US '179.

Claims 1-3: US '179 discloses a method for plating successive metal layers on a substrate, including a copper substrate, comprising depositing a metal more noble than the copper, listing among other palladium from an acidic solution, and thereafter depositing another metal, listing among others silver (Column 5, lines 57-Column 6, line 51). Therefore, US '179 clearly discloses a copper substrate, followed by a plating layer of palladium, and then a silver plating is a known predictable solution and the claim would have been obvious because "a person of ordinary skill has good reason to pursue the known options with his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense."

Additionally, one of ordinary skill in the art, viewing the reference as a whole, would have reasonably expected to successfully deposit a palladium

plating layer on a copper substrate followed by a silver plating because US '179 discloses that such is known and suitable in the art.

Additionally, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d.

Claim 4: US '179 discloses using an acidic acid and discloses using sulfuric acid in the first plating bath (example 2).

Claim 16: US '179 discloses cleaning the substrate with an alkali degreasing agent prior to the first plating (Example 1).

Claim 20: US '179 multiple layer plating layer must necessarily be bendable or solderable. While, US '179 does not explicitly disclose such a feature, US '179 teaches each and every process step and limitation of the applicant's claims, including the step of plating a more noble metal then copper on a copper surface and thereafter plating silver thereon as discussed above. Since the bendable and solderable feature as listed by the applicant's claimed process is simply a function of the steps taken, and US '179 teaches the claimed process steps, the process of US '179 would have inherently produced a bendable or solderable layer unless essential process steps and/or limitations are missing from the applicant's claims.

Art Unit: 1792

6. Claims 1-4, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6180179 by Kawaguchi et al., hereinafter US '179 in view of WO 02/29132 by Hutchinson et al. hereafter WO '132 or visa versa.

US '179 discloses all that is discussed in paragraph 5 above, however, the reference fails to disclose the specifics of the displacement plating of silver. However, WO '132 discloses a known and suitable method of depositing silver on copper, discloses silver plating using silver bromide complex (page 9) in a bath of pH of 0 to 6 (page 13). Therefore, taking the references collectively, it would have been obvious to one of ordinary skill in the art to have modified US '179 with the bath composition as taught by WO '132 with a reasonable expectation of predictable results because WO '132 discloses that silver bromide complex solution is known in the art to provide displacement plating of silver.

Alternatively, WO '132 discloses a method for plating silver on copper by way of displacement plating (abstract), however, the reference fails to disclose first plating a metal layer more noble than copper followed by a silver deposition process. However, US '179 discloses the multiple layer process provides advantages over the single layer plating process, including having excellent mechanical and adhesion properties (abstract) among others and therefore, taking the references collectively, it would have been obvious to one of ordinary skill in the art to have modified WO '132 with the multiple layer process as suggested by US '179 with a reasonable expectation of success as well as to reap the benefits as those disclosed by US '179.

Additionally, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d.

Claim 13-14: WO '132 discloses diethylene triamine, ethylene diamine, among others as copper (II) complexing agents (page 15).

Claim 15: WO '132 discloses the silver plating bath comprises a surface active agent (page 15).

Claim 16-17: WO '132 discloses cleaning in a sodium peroxy disulfate prior to plating (example 1).

Claim 18: WO '132 discloses horizontal conveyance method (page 17).

Claims 19 and 20: WO '132 discloses a printed circuit board, followed by plating with metal, thereafter subjecting to soldering process, i.e. a solderable layer as required by claim 20 (example 1, pages 1-2).

7. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US '179 in view of WO '132 or visa versa and further in view of US Patent Publication 20030000846 by Rzezniak et al., hereinafter USPP '846.

US '179 in view of WO '132 or visa versa is applied here as applied above in paragraph 6, however the references fail to disclose a complexing agent of copper (I) and those claimed. however, USPP '846 discloses known and suitable complexing agents for silver displacement plating on copper include diethylene

Art Unit: 1792

triamine, ethylene diamine, among others as copper (II) complexing agents as well as copper (I) complexes including 2,2-bipyridine or 1,10 phenanthroline (0028). Therefore, USPP '846 discloses equivalency of the complexing agents in the silver plating bath and the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Additionally, Substitution of equivalents requires no express motivation. *In re Fount*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152, USPQ (CCPA 1967).

Finally, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d.

Allowable Subject Matter

8. Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art cited or reviewed by the examiner alone or in combination reasonably suggests depositing a silver layer using a first method and second method, wherein the deposition rate of the first silver at most half the rate of the second silver deposit. The closest prior art cited by the examiner, US

Art Unit: 1792

Patent 5882802, discloses noble metal coating with varying the concentration of silver but fails to disclose the rate between a first and second layer. The examiner notes WO '132 discloses adjusting the rate of deposition of the silver by temperature or bath composition, however, the reference does not suggest or make obvious alone or in combination with another reference depositing a first layer of silver at a rate at most half that of a second subsequent layer as required by the present claim.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4529667 discloses a first layer of Pd on copper followed by overcoating with electroplating silver. US Patent Publication 20020159295 discloses displacement plating of silver, see entire reference. US 5733599 discloses silver deposits on copper followed by gold, platinum or palladium.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID TUROCY whose telephone number is (571)272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David Turocy/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792